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New Ideas in Construction for Vocational Education.

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One of the most dramatic developments of the new educational programs is the increase in the construction of area vocational schools in the past two and a half years from a total of 405 to 975. The anticipated enrollments by 1975 will almost triple the present enrollments, and to accommodate them there is a need for 1,885 vocational area schools. By 1975, educators will be faced with a deficit of over one million student places. Regarding these area vocational schools, discussion centers around the following--(1) the concept of flexibility and adaptability, (2) environmental standards, (3) acoustical control, (4) instructional staff, (5) occupational clusters, (6) library, (7) facilities for the handicapped, (8) storage facilities, and (9) large city problems. Vocational-technical facilities are illustrating the following trends--(1) greater emphasis on the aesthetic design values, (2) prime features of flexibility, adaptability, modular units, (3) environmental control, (4) preparation room, (5) teacher occupational clusters, (6) student lounges-canteen areas, (7) library-technical resource center, (8) centralized receiving area, (9) facilities for the handicapped, and (10) single school versus educational park plazas. (RK)

NEW IDEAS IN CONSTRUCTION FOR VOCATIONAL EDUCATION

The availability of funds for construction of area vocational education facilities under the provisions of the Vocational Education Act of 1963 has provided the stimulus to the States and Territories in breaking through one of the most serious obstacles to the growth of vocational education--the lack of adequate facilities and up-to-date equipment. Implicit in the remarks of the Act's congressional supporters was the expectation that the States would develop an extensive network of area vocational-technical schools which would offer programs of "high quality, which is realistic in the light of actual or anticipated opportunities for gainful employment, and which is suited to their needs, interest, and ability to benefit from such training."

Educators were faced with the problem that more than 100 million Americans would be in our labor force during 1966-1967, a number equal to the entire population of the United States around 1915. Statistics clearly show that nearly one-half of the labor force will be composed of those in the 14 to 25 year old age group. Consequently, there is and will continue to be an urgent demand for vocational training and retraining to provide the kinds of skills which will enable these people to keep abreast of the present and future technological advances. Confronted with these problems, we have witnessed one of the most dramatic developments of the new vocational education

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programs the construction of area vocational schools in the past two and a half years from a total of 405 to 975. Although we look with pride at these accomplishments, we must also note that anticipated enrollments by 1975 will almost triple our present enrollments and to accommodate them we have need for 1,885 vocational area schools. Due to the present deficit of work stations, even if we continue to build at the present rate, by 1975, we will still be faced with a deficit of over one million student places.

The Concept of Flexibility and Adaptability

Today's challenge and the challenge of the future demand that facilities be flexible and adaptable to accommodate the evolving technological advancements in industry. We must not allow the "static wall" concept to dictate the development of programs to meet these needs. The school designed to contain conventional shops, laboratories, lecture halls, and classrooms, and built with permanent weight-bearing walls, may prove inadequate to meet the present and future vocational-technical education demands. We are in a period of educational history which is both challenging and creative. It demands constant change and reassessment of the technological advances and their implications on facilities, equipment, and programs.

The ability to rearrange and to adjust partitions with a minimum of effort is an almost universal demand. This requires manipulative space, which in its most advanced form demands easy

convertibility--areas which may be combined or subdivided as the needs of the students and curriculum require. Many years of industrial experience have proved that properly designed facilities geared to the concept of flexibility are both economical and readily adaptable to various situations such as would be encountered in vocational-technical facilities.

Environmental Standards

However, the incorporation of flexible partitioning systems alone will not fulfill our long-range objectives unless we extend the concept of flexibility to include our mechanical units of heat, light, and complete environmental control. With the ever-increasing emphasis on vocational-technical education programs, educational facility planners must strive for maximum utilization of these facilities. They must be designed for 24 hours a day, year-round utilization, which will demand precise, factual, and accurate performance specifications regarding "zone control" to achieve maximum economical environmental standards. A number of vocational-technical schools recently completed, and a number now in various phases of construction have been designed for full utilization of air conditioning. However, we would caution that the "windowless" building concept demands that we incorporate into our designs adequate methods of egress from these buildings in times of emergencies. Costs of air conditioning can be minimized if it is considered at the planning and designing state.

Studies have shown that certain designs lend themselves so well to air conditioning that the difference between the cost of building with or without air conditioning is negligible.

Accoustical Control

As we design for greater flexibility and adaptability, the control or transmittal of sound require special consideration.

In the "static wall" concept the problem of containing and absorbing sounds within a given area was relatively easy to cope with. Now in maximizing our flexibility concepts, we find that greater emphasis must be given to the installation of accoustical materials on ceilings, walls, and doors and to the grouping of areas of instruction which have a commonality of sound, odors, and dust.

Instructional Staff

It is becoming more and more apparent that the conventional school day and year are no longer sufficient to do the job that needs to be done. To offer the variety of programs to meet these demands, it becomes imperative that we consider the utilization of more than one instructional staff. We see the need for more team teaching and the scheduling of students so that the school can offer a more individualized form of instruction and use the time and talent of teachers more professionally and productively. The teachers will require well-equipped preparation rooms with adequate storage facilities and screens and equipment for previewing films, slides, etc., which can also serve as a conference room for the "team" to meet and improve

individual phases of their teaching to meet the program goals.

Occupational Clusters

The reorganization of staff and students will result in a reshaping of our present methods of teaching. More and More we see the shops, classrooms, and laboratories being developed around an occupational cluster or some modification of this principle. As occupational clusters are developed, we see a modification of design relative to the long conventional corridors. Many schools are incorporating interior corridors into a centralized and pod unit, whereby the corridor is designed as a portion of a larger lecture area, still meeting the necessary traffic patterns, safety codes, and regulations.

It is also becoming increasingly evident that we must utilize cross-sectional corridor units to effectively zone and maintain to a minimum the traffic flow in main corridors.

Future classrooms must be furnished with built-in equipment for the showing of films, closed-circuit TV, and other educational media. Careful consideration must be given to the size of these rooms, planned on a modular basis, but sized according to need and possible future expansion at a minimum cost and effort.

Greater demands will be placed on the use of lecture halls; some situations will require a classroom-size lecture hall, but in many instances, primarily for other than the day school students, large lecture halls will be of prime importance. These should offer a complete unobstructed view for all students, perhaps utilizing the

round, stadium-type lecture hall used in many other professions today. These lecture halls will have to be designed not only for the lecture and the visual aids, but must also include track systems, and turnstile floor areas for demonstrations of heavier equipment. The lecture hall will become a truly educational unit which can be divisible into a number of smaller rooms in order to minimize the traffic pattern and get maximum utilization of this huge and expensive, but vital area.

Cafeterias which have in the past been designed primarily for the serving of a noon-hour luncheon, are now being developed to serve multiple functions. A cafeteria is no longer primarily used for the serving of a meal, but is now designed so it can serve as a teaching laboratory and the dining area as a supporting unit to the programs of culinary arts. We must also consider the utilization of this area to serve two, three, or more meals a day to meet the needs of many of our socio-economically deprived youths, as well as provide food services for those who come to our programs directly from their jobs.

As we progress further into maximum utilization of facilities, and we develop programs of varying lengths and the elimination of block term units, we must provide provisions for student lounges and canteen areas.

Library

As we expand our vocational-technical facilities to meet the needs of all the people in our communities and provide programs which

will enable them to keep abreast of new and emerging technologies, it is of particular importance to note that vocational educators are giving much thought to the important role of the school library. In this rapidly changing world, we find ourselves endowed with a richness and abundance of printed materials such as the world has never seen before. We also see an understanding and philosophy that the nature and role of the library has changed. It is now looked upon as an integral part of each program; and as such, one of its primary roles is to serve as a community technical resource center. No longer can we continue to develop these facilities based on the concept of the number of volumes on bookshelves. They must be designed in such a way that they have the capability of utilizing and expanding into all phases of communication techniques, which will link electronically our schools throughout the Nation. We must see more generous facilities for this area to provide for such utilization as: micro-films, two-way telephone, lecture communication, video-taped lectures, recording facilities, informed reading areas and individual electronically hooked-up study carrels. These and many other educational media will be emanating from this resource center, but they will only be as effective as the trained personnel who are employed.

We cannot achieve maximum utilization of such a facility unless we also operate it on the basis that it must remain open at all times; and consequently, it must be located within the confines of our educational plant so that it is readily available to the public at a minimum of interior zone control.

Facilities for Handicapped

"More than a quarter of a million Americans are in wheelchairs, and many persons have some other disability which makes entering and leaving the average building a major problem,: President Johnson has said. "Research has provided us with some of the standards to make buildings and facilities more accessible to the handicapped. We now must put this information to practical use by eliminating architectural barriers from existing buildings, and preventing them in the bast amount of public and private construction which lies ahead."

In many of our schools there are many thoughtless barriers-- stairs, narrow doorways, revolving doors, inadequate handrails, elevators, and unusable restrooms--all of which have had the effect of terminating the educational opportunities of many of our handicapped.

Currently, 25 States have passed legislation requiring that public buildings be accessible to the disabled. Ten more States are planning to introduce such legislation in 1966-67.

Much has been done to overcome this problem in the new area vocational-technical education schools. Exterior ramps have been designed for ease of movements from cars and buses. Electronically operated doors have been installed, doorways widened, drinking fountains placed within reach, restrooms built to accommodate wheelchair traffic, and an appropriate number of telephone booths designed to serve the handicapped.

Storage Facilities

As we proceed to involve more students in any teaching area, we find ourselves faced with the complexing problem of adequate tool storage, material storage, and project storage. It is not possible to maximize the philosophy of flexibility and adaptability if we continue the States' concept of these units to remain. All of these facilities are of prime importance, but they must all be designed and developed to assist and not hinder the ability to readjust the size and shape of the teaching area involved. Many variations of tool storages are being employed; perhaps the outstanding one are those units that are movable and can be rolled from one location to another.

The problem of budgeting and purchasing large quantities of materials for these classes is being resolved in many schools in the incorporation of a large centralized receiving area which is also designed as a teaching station. In this area, students will learn how to receive and distribute materials and learn the basic principles of stock and warehouse control.

Large City Problems

The city school systems today are faced with a monumental task of overcoming the construction lag of the depression years of the thirties, followed by building restrictions of World War II. The largest impact of population growth was primarily in the suburbs, and that is where the major emphasis in new school construction took place.

Schools designed for the suburbs incorporated the philosophy of serving not only for an educational purpose but for social and community functions. However, when new schools were built in the heart of our city complexes, too many educators and architects looked upon them as a single-purpose institution, operating on a limited daily basis. In many instances they did not incorporate the philosophy which exists in the suburban areas that these schools must serve as a community institution serving all the people of the community, performing social and cultural as well as educational functions and that they must be operated on a year-round basis.

The city school, regardless of its size and the nature of its facilities, is inextricably enmeshed in the sociology of the city. Throughout the Nation we are aware of the cities' schools responding to this need and are coming up with many new ideas and new ways to deal with this perplexing problem.

Due to the prohibitively high cost for school facilities in the city and to meet the demands of the society, one of the newer concepts is the joint-occupancy concept in which school facilities are built into private or public housing projects and in a number of cases into commercial office buildings. The benefits derived from these joint-occupancies could provide free sites for public schools, and in some cases could result in rental incomes in excess of the costs of debt retirement and operating costs. These surplus dollars would be utilized to further promote educational programs.

Another method being employed on a limited basis, but which will deserve much consideration is the application of the land in the air or commonly called "air rights principle." Three outstanding applications of this principle involve the construction of a community college which straddles a subway car yard; a high school which will straddle the Hutchinson River Parkway; and a decision to fill in 40 acres of Jamaica Bay, New York, to create a site for a new South Queens High School.

The cities are in many instances attempting to develop school sites on terrains which are undeveloped or cheaper and normally would not be considered. With imagination and ingenuity, high-rise type buildings have been developed on steep grades; schools have been built on stilts to have undercover facilities; and in some instances, schools have been experimenting with the use of artificial turf to create usable and attractive spaces on roof tops.

Perhaps, one of the most direct challenges to the neighborhood school is that of creating educational parks or plazas. Today the concept of an educational park or plaza connotes different philosophical approaches to our educational problems. However, they usually call for a combination of schools of all levels, from elementary up through community college on a single site.

With each passing day the statement, "education for all persons of all ages in all communities" is taking on a new and much broader meaning. It soon becomes apparent that the school system, while it cannot be asked to assume the total responsibility for the community

services, will become the focal point of the efforts to revitalize neighborhoods' cultural, social, and educational standards.

We who are involved in vocational education must look critically at our role and make every effort to provide a total program, which will provide a combination of the cultural, social, and educational standards which are so imperative to all our people.

New trends:

In summary, the vocational-technical facilities are illustrating the following trends:

- o Greater emphasis on the aesthetic design values
- o Prime features, flexibility, adaptability, modular units
- o Environmental control
- o Preparation room
- o Teacher occupational clusters
- o Student lounges-canteen area
- o Library-technical resource center
- o Centralized receiving area
- o Facilities for the handicapped
- o Single school vs. educational park, plazas